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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/507,020	09/08/2004	Masashi Iwami	038440-0112	7687

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EXAMINER	
NGUYEN, TUAN HOANG	

ART UNIT	PAPER NUMBER
2618	

DATE MAILED: 07/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/507,020	IWAMI ET AL.	
	Examiner	Art Unit	
	Tuan H. Nguyen	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 September 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-11,13-22 and 24-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-11,13-22 and 24-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/8/04 and 12/3/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 09/08/2004 and 12/03/2004 has been considered by Examiner and made of record in the application file.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 2, 6, 13, 17, 24 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant admitted prior art in view of Kohno et al. (U.S PAT. 6,763,062 hereinafter "Kohno").

Consider claims 2, 6, 13, 17, 24 and 28, applicant admitted prior art in the specification teaches a radio receiving which has a plurality of antennas and which extracts a desired signal by adaptive array processing, comprising: adaptive array processing estimating weights for plurality of antennas using a predetermined type of array parameter, assigning estimated weights to reception signals received by plurality of antennas, and combining the weighted reception signals to extract desired signal (page 2 lines 3-8); and array parameter optimal value estimation estimating an optimal value of predetermined type of array parameter which optimizes the weight estimation performance of adaptive array processing (page 3 line 24 through page 4 line 1), wherein array parameter optimal value estimation includes: determination determining a propagation environment of reception signals (page 3 lines 16-19).

The prior art does not explicitly show that storage previously storing a table consisting of optimal values of the array parameter corresponding to different conditions of propagation environment; and table reference referring to table, thereby estimating an optimal value of array parameter appropriate to the propagation environment of the reception signals determined by determination.

In the same field of endeavor, Kohno teaches storage previously storing a table consisting of optimal values of the array parameter corresponding to different conditions of propagation environment (col. 8 lines 11-25); and table reference referring to table, thereby estimating an optimal value of array parameter appropriate to the propagation environment of the reception signals determined by determination (col. 12 lines 14-33).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use, storage previously storing a table consisting of optimal values of the array parameter corresponding to different conditions of propagation environment; and table reference referring to table, thereby estimating an optimal value of array parameter appropriate to the propagation environment of the reception signals determined by determination, as taught by Kohno, in order to provide a radio communication system which allows good communications at all times irrespective of variations in electromagnetic radiation propagation environment and allows the hardware arrangement to be made simple.

5. Claims 3, 5, 8, 10-11, 14, 16, 19, 21-22, 25, 27, 30, and 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant admitted prior art in view of McGuffin (U.S PAT. 4,217,586).

Consider claims 3, 8, 14, 19, 25 and 30 applicant admitted prior art in the specification teaches a radio receiving device which has a plurality of antennas and which extracts a desired signal by adaptive array processing, the device comprising: adaptive array processing estimating weights for plurality of antennas using a predetermined type of array parameter, assigning estimated weights to reception signals received by plurality of antennas, and combining the weighted reception signals to extract desired signal (page 2 lines 3-8); and array parameter optimal value estimation estimating an optimal value of predetermined type of array parameter which

optimizes the weight estimation performance of adaptive array processing (page 3 line 24 through page 4 line 1), wherein array parameter optimal value estimation includes: operation control causing adaptive array processing to operate multiple times in a single time slot, in correspondence with a plurality of values of array parameter (page 2 lines 17-23).

The prior art does not explicitly show that indicator calculation calculating an indicator representing the weight estimation performance of adaptive array processing corresponding to a current value of array parameter, each time adaptive array processing is operated; and optimal value estimation estimating a value of array parameter which optimizes the weight estimation performance of adaptive array processing in time slot, based on calculated indicators.

In the same field of endeavor, McGuffin teaches indicator calculation calculating an indicator representing the weight estimation performance of adaptive array processing corresponding to a current value of array parameter, each time adaptive array processing is operated (col. 2 lines 50-60); and optimal value estimation estimating a value of array parameter which optimizes the weight estimation performance of adaptive array processing in time slot, based on calculated indicators (col. 8 lines 40-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use, indicator calculation calculating an indicator representing the weight estimation performance of adaptive array processing corresponding to a current value of array parameter, each time adaptive array

processing is operated; and optimal value estimation estimating a value of array parameter which optimizes the weight estimation performance of adaptive array processing in time slot, based on calculated indicators, as taught by McGuffin, in order to provide an adaptive array with information enabling it to form a beam towards signals from unknown directions of arrival in a multipath environment and the communication modem with sufficient signal information during this transition period to permit the identification of the desired signal.

Consider claims 5, 16, and 27 McGuffin further teaches array parameter optimal value estimation includes: operation control causing the adaptive array processing to operate in each of a plurality of time slots using a value of array parameter which is fixed over plurality of time slots (col. 8 lines 40-60); indicator calculation calculating an indicator representing the weight estimation performance of adaptive array processing corresponding to a current fixed value of array parameter, each time adaptive array processing is operated (col. 2 lines 50-60); averaging calculated indicator over plurality of time slots (col. 8 line 18-31); repeat control causing operation control, indicator calculation and averaging to repeatedly execute their operations over plurality of time slots (col. 8 line 18-31); and optimal value estimation determining a value of array parameter which optimizes the weight estimation performance of adaptive array processing, based on the indicators each averaged by averaging over corresponding plurality of time slots (col. 8 line 40-60).

Consider claims 10, 21 and 32, applicant admitted prior art in the specification teaches a radio receiving device which has a plurality of antennas and which enables spatial multiple connection of a plurality of users' terminals by adaptive array processing, the device comprising: adaptive array processing, provided in correspondence with respective users' terminals, for estimating weights for plurality of antennas using a predetermined type of array parameter, assigning estimated weights to reception signals received by plurality of antennas, and combining the weighted reception signals to extract a signal from corresponding users' terminal (page 2 lines 3-8); and array parameter optimal value estimation estimating optimal values of predetermined type of array parameter which optimize the weight estimation performance of respective adaptive array processing (page 3 line 24 through page 4 line 1), wherein array parameter optimal value estimation includes: operation control for causing the adaptive array processing means to operate in each of a plurality of time slots using a value of array parameter which is fixed over plurality of time slots (page 2 lines 17-23).

The prior art does not explicitly show that indicator calculation calculating an indicator representing the weight estimation performance of adaptive array processing corresponding to a current fixed value of array parameter, each time adaptive array processing is operated; averaging averaging calculated indicators over plurality of time slots; repeat control causing operation control, indicator calculation and averaging to repeatedly execute their operations over plurality of time slots; and optimal value estimation determining a value of array parameter which optimizes the weight

estimation performance of adaptive array processing, based on the indicators each averaged by averaging over plurality of time slots.

In the same field of endeavor, McGuffin teaches indicator calculation calculating an indicator representing the weight estimation performance of adaptive array processing corresponding to a current fixed value of array parameter, each time adaptive array processing is operated (col. 2 lines 50-60); averaging calculated indicators over plurality of time slots (col. 8 lines 18-31); repeat control causing operation control, indicator calculation and averaging to repeatedly execute their operations over plurality of time slots (col. 8 lines 18-31); and optimal value estimation determining a value of array parameter which optimizes the weight estimation performance of adaptive array processing, based on the indicators each averaged by averaging over plurality of time slots (col. 8 lines 40-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use, indicator calculation calculating an indicator representing the weight estimation performance of adaptive array processing corresponding to a current fixed value of array parameter, each time adaptive array processing is operated; averaging averaging calculated indicators over plurality of time slots; repeat control causing operation control, indicator calculation and averaging to repeatedly execute their operations over plurality of time slots; and optimal value estimation determining a value of array parameter which optimizes the weight estimation performance of adaptive array processing, based on the indicators each averaged by averaging over plurality of time slots, as taught by McGuffin, in order to

provide an adaptive array with information enabling it to form a beam towards signals from unknown directions of arrival in a multipath environment and the communication modem with sufficient signal information during this transition period to permit the identification of the desired signal.

Consider claims 11, 22, and 33 McGuffin further teaches the indicator representing the weight estimation performance of adaptive array processing is a weight estimation error (col. 8 lines 1-17).

6. Claims 4, 9, 15, 20, 26, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant admitted prior art in view of McGuffin (U.S PAT. 4,217,586) as applied to claims above, and further in view of Huynh et al. (U.S PAT. 6,028,901 hereinafter "Huynh").

Consider claims 4, 9, 15, 20, 26, and 31 the applicant admitted prior art and McGuffin, in combination, fails to discloses operation control employs, as one of the plurality of values of array parameter in a succeeding time slot, the value of array parameter estimated by optimal value estimation in a preceding time slot; and optimal value estimation estimates, based on the indicators calculated by indicator calculation over a plurality of time slots, a value of array parameter which optimizes the weight estimation performance of adaptive array processing over plurality of time slots. However, Huynh teaches operation control employs, as one of the plurality of values of

array parameter in a succeeding time slot, the value of array parameter estimated by optimal value estimation in a preceding time slot (col. 5 line 61 through col. 6 line10); and optimal value estimation estimates, based on the indicators calculated by indicator calculation over a plurality of time slots, a value of array parameter which optimizes the weight estimation performance of adaptive array processing over plurality of time slots (col. 11 lines 18-49). Therefore, it is obvious to one of ordinary skill in the art at the time the invention was made to incorporate the disclosing of Huynh into view of the applicant admitted prior art and McGuffin, in order to provide a device and method for delay spread estimation in a cellular telephone signal path, and for selection of a receiver equalizer based on such estimation.

7. Claims 7, 18, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant admitted prior art in view of Kohno et al. (U.S PAT. 6,763,062 hereinafter "Kohno") as applied to claims above, and further in view of McGuffin (U.S PAT. 4,217,586).

Consider claims 7, 18, and 29 the applicant admitted prior art and Kohno, in combination, fails to discloses propagation environment is at least one of the degree of multiplexing of spatial multiple connection and the amount of fading. However, McGuffin teaches propagation environment is at least one of the degree of multiplexing of spatial multiple connection and the amount of fading (col. 2 line 11-29). Therefore, it is obvious to one of ordinary skill in the art at the time the invention was made to incorporate the

disclosing of McGuffin into view of the applicant admitted prior art and Kohno, in order to provide a radio communication system which allows good communications at all times irrespective of variations in electromagnetic radiation propagation environment and allows the hardware arrangement to be made simple.

Conclusion

8. Any response to this action should be mailed to:

Mail Stop_____ (Explanation, e.g., Amendment or After-final, etc.)

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Facsimile responses should be faxed to:

(571) 273-8300

Hand-delivered responses should be brought to:

Customer Service Window

Randolph Building

401 Dulany Street

Alexandria, VA 22313

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan H. Nguyen whose telephone number is (571) 272-8329. The examiner can normally be reached on 8:00Am - 5:00Pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Maung Nay A. can be reached on (571) 272-7882. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information Consider the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tuan Nguyen
Examiner
Art Unit 2618

NAY MAUNG
SUPERVISORY PATENT EXAMINER